

Computer Science (COMP) 378

Introduction to Database Management (Revision 8)

Delivery mode: [Individualized study online](#)  with [eText](#) 

Credits: 3



Area of study: Science

Prerequisites: COMP 361

Precluded: None

Challenge: COMP 378 has a challenge for credit option.

Faculty: [Faculty of Science and Technology](#) 

Status: Replaced with new revision, see the [course listing](#)  for the current revision 

Overview

This course is developed along the database development life cycle, which will allow students to easily relate topics to one another along a logical path. The structure of the course follows the development of the material in *Modern database management* (10th ed.) (Hoffer et al., 2010). The *Study Guide* consists of nine units; each of which consists of one or more sections. Each section has a goal, objectives, and activities.

The theoretical material in this course is supplemented by labs, Assignment, and Project components. The labs provide hands-on training for students, and link to commercial products.

Outline

The course consists of the following nine units.

Unit 1 - Introduction to Database Systems:

This unit discusses the evolution of file processing systems, and introduces the role of databases in organizations. It also introduces the core components of a database environment.

Unit 2 - Data Modeling: The Entity-Relationship Diagram:

This unit discusses the entity-relationship (E-R) diagram: how it may be used to model real-life situations, and its symbols and constructs.

Unit 3 - The Relational Model and Normalization:

This unit explains the relational model, normalization, and how to transform an entity-relationship data diagram into a relational model.

Unit 4 - Physical Database Design:

This unit introduces the physical design process, its steps, inputs, and outputs.

Unit 5 - SQL - A Standard Navigation Language for Relational Databases:

This unit provides a thorough presentation of the SQL language used by most database management systems.

Unit 6 - Introduction to Two-Tier and Three-Tier Architectures, and the Internet Database Environment:

This unit introduces the Internet database environment, including Web-enabled databases, Web-enabled system design, and programming in two-

tier and three-tier architectures. It also discusses XML and data exchange on the Internet.

Unit 7 - Introduction to Data Warehousing:

This unit introduces the fundamental concepts of data warehousing. The data warehouse architectures and OLAP tools are explained.

Unit 8 - Data Quality and Database Administration:

This unit is devoted to data quality, data integration, and database administration. The roles of data administration and database administration, their function, and their importance to an information resource will be discussed.

Unit 9 - Overview of Object-Oriented Databases:

This unit introduces the object-oriented data model, and discusses the implementation of object persistence using relational databases.

Learning outcomes

Students successfully completing this course will be able to

- analyze the data and data organization needs of organizations;
- apply the Entity-Relationship (E-R) Model for building information systems' data models;
- transform an E-R diagram into a relational model, and use normalization to create a database relational schema;
- discuss the physical database design process of producing an efficient and tuned database;
- explain when denormalization is preferred over normalization, and use vertical and horizontal partitioning for data distribution;
- elaborate on data storage and indexing options, and perform query optimization;
- use SQL for database creation, manipulation, and control;
- explain the client/server model, and describe the key components used to implement internet database environments;

- perform basic database administration tasks;

Evaluation


To **receive credit** [↗](#) for COMP 378, you must achieve an average grade of at least **D (50 percent)** [📄](#) from the combined marks of the invigilated final examination and the online quiz, and an average grade of at least D (50 percent) from the combined marks of the Assignments and Project. The weighting of the composite grade is as follows:

Activity	Weight
Assignment 1	10%
Assignment 2	15%
Assignment 3	15%
Project	20%
Online Quiz	10%
Final Online Exam	30%
Total	100%

The **final examination** for this course must be taken online with an AU-approved exam invigilator at an approved invigilation centre. It is your responsibility to ensure your chosen invigilation centre can accommodate online exams. For a list of invigilators who can accommodate online exams, visit the [Exam Invigilation Network](#) [↗](#).

To learn more about assignments and examinations, please refer to Athabasca University's [online Calendar](#) [↗](#).

Materials

Hoffer, J. A., Venkataraman, R., & Topi, H. (2010). *Modern database management* (10th ed.). Prentice Hall.  (eText)

eText

Registration in this course includes an electronic textbook. For more information on **electronic textbooks** [↗](#), please refer to our **eText Initiative site** [↗](#).

Other Materials

Computer Science 378 is accompanied by a set of labs and a project to familiarize students with the database techniques and languages that are being used in work environments. The labs use the Teradata University Network, while the project can be implemented using either SQL Server or Oracle. You can download SQL Server using the SCIS access to the **MSDN Academic Alliance Software Center** [↗](#), or download the free version of the **Oracle database** [↗](#).

The remaining learning materials for COMP 378 are distributed in electronic format. At this time, those materials include:

- *Computer Science 378 Study Guide* (including lab instructions)
- Detailed descriptions of the requirements for the individual Assignments and Project.
- An online quiz.
- A course evaluation form
- Links to a variety of resources on the World Wide Web.
- Additional supporting materials of interest to students of *Computer Science 378* may occasionally be made available electronically.

Special Course Features

Computer Science 378 is offered in a computer-mediated communications (CMC) mode, and can be completed at the student's workplace or home. It is a core course in the B.Sc. Computing and Information Systems (CIS) program.

Challenge for credit

Overview

The Challenge for credit process allows you to demonstrate that you have acquired a command of the general subject matter, knowledge, intellectual and/or other skills that would normally be found in a university-level course.

Full information about [Challenge for credit](#) can be found in the Undergraduate Calendar.

Evaluation

To [receive credit](#) for the COMP 378 challenge, you must achieve a grade of at least **D (50 percent)** on the examination and 50 per cent on the project.





Activity	Weight
Project	50%
Online Exam	50%
Total	100%

The **challenge examination** for this course must be taken online with an AU-approved exam invigilator at an approved invigilation centre. It is your responsibility to ensure your chosen invigilation centre can accommodate online exams. For a list of invigilators who can accommodate online exams, visit the [Exam Invigilation Network](#).



[Challenge for credit course registration form](#)

Important links

- › [Academic advising](#) 
- › [Program planning](#) 
- › [Request assistance](#) 
- › [Support services](#) 

Athabasca University reserves the right to amend course outlines occasionally and without notice. Courses offered by other delivery methods may vary from their individualized study counterparts.

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